## REMARKS

### I. IN THE OFFICE ACTION

The Examiner rejected claims 1-23 under the provisions of 35 U.S.C. § 103 as allegedly being unpatentable over U.S. Patent No. 6,178,980 B1 issued to Storm ("Storm") in combination with U.S. Patent No. 6,015,779 issued to Eaton et al. ("Eaton '779") or U.S. Patent No. 5,869,570 issued to Eaton et al. ("Eaton '570"). The Examiner states that Storm discloses a method of reducing the viscosity of a heavy oil flowing through a pipe which comprises mixing heavy oil, water in an amount of 1-10% by volume, and an effective amount of a $C_1$ to $C_{10}$ alcohol such as 1-propanol, 1-butanol, 1-pentanol, 1-hexanol, 1-heptanol, or mixtures thereof. Office Action, page 2. The Examiner states that the alcohol component of Storm meets the limitation of an alfol alcohol of Applicant's invention, and that Strom teaches that the mixture may further include a polymeric drag reducing agent in a concentration from about 1 to about 10,000 ppm. *Id.*

With respect to Eaton, the Examiner states that Eaton discloses polyalphaolefin drag reducing components that meet the claim limitations for forming polyalphaolefin components, and states that the motivation to combine the disclosure of Storm with the disclosure of Eaton is the teaching in column 8 of Storm allowing for the addition of a polymeric drag reducing agent in a concentration of from about 1 to about 10,000 ppm. Office Action, page 3.

## II. DISCUSSION

### A. Amendments to Claims 9, 10, 15 and 17

Applicant has amended claims 9, 10, 15 and 17 to correct typographical errors and to identify certain alpha olefin monomers for forming several embodiments of the drag reducing agent slurries of the present invention.

### B. Information Disclosure Statement

On December 30, 2002, Applicant sent by First Class Mail, with a Certificate of Mailing under 37 C.F.R. § 1.8, a Fourth Supplemental Information Disclosure Statement Under 37 C.F.R. §§ 1.97 and 1.98 ("Fourth Supplemental IDS"). The Office received the Fourth Supplemental IDS on January 3, 2003. A copy of the Fourth Supplemental IDS and the return postcard with the Office's stamp are attached hereto as Exhibit A. In light of Applicant's mailing of the Fourth Supplemental IDS prior to the mailing by the Office of a first action on the merits, Applicant respectfully requests the Examiner to consider the references identified in the Fourth Supplemental IDS during the examination of this application and to indicate that such references have been considered.

### C. Claim Rejections - 35 U.S.C. § 103

Identification in the prior art of each individual part claimed in a patent is insufficient to defeat patentability of the whole claimed invention. *In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000); *In re Rouffett*, 149 F.3d 1350, 1357 (Fed. Cir. 1998). Rather, to establish obviousness based

on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by applicant. *In re Kotzab*, 217 F.3d at 1370. Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference. *Id.* The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved. *Id.* In addition, the teaching, motivation or suggestion may be implicit from the prior art as a whole, rather than expressly stated in the references. *Id.* The test for an implicitly showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art. *Id.* Whether the Board of Patent Appeals and Interferences relies upon an express or an implicit showing, it must provide particular findings related thereto. *Id.* Broad conclusory statements standing alone are not "evidence." *Id.* (quotes in the original).

Applicant respectfully disagrees with the Examiner's reasons for rejection of claims 1-23 as allegedly being obvious over Strom in view of Eaton '779 or Eaton '570. Briefly, Applicant notes that Storm is not directed to drag reducing agent slurries, but instead is directed to modifying the viscosity of heavy oil in a pipeline by mixing the heavy oil with water and alcohol and then injecting this mixture through the pipeline. Further, there is no motivation to combine the teachings of Storm with the teachings of Eaton '779 or Eaton '570.

1. Storm Does Not Disclose Drag Reducing Agent Slurries or Processes for Forming Drag Reducing Agent Slurries

Storm does not render any of claims 1-23 obvious, either alone or in combination with Eaton '779 or Eaton '570 because Storm does not disclose any process for forming drag reducing agent slurries or any drag reducing agent slurries. Instead, Storm discloses a process of reducing the viscosity of heavy crude oil flowing through the pipeline by mixing the heavy crude oil with water and alcohol. The objective of Storm is a method of reducing the viscosity of heavy crude oil using water and alcohol instead of by heating the heavy oil (Col. 1, lines 34-53), diluting the heavy oil (Col. 1, lines 54-67), or mixing the heavy oil with water/surfactant mixtures (Col. 2, lines 1-44). Moreover, Storm expressly recognizes the fact that Storm does not disclose any process for forming drag reducing agent slurries, or any drag reducing agent slurries, by stating that the objective of Storm is to reduce the viscosity of the heavy crude oil flowing through a pipeline by forming an oil/water/alcohol mixture having a flow rate that is sufficiently turbulent so that commercial drag reducing agents may then be injected into the pipeline to reduce the friction, and increase the flow, of the oil/water/alcohol mixture. Col. 2, lines 55-67.

Therefore, Storm teaches that due to heavy crude oil having a very high viscosity, it is generally unable to reach a turbulent flow in some pipelines. As such, the viscosity of the heavy crude oil must be modified to increase its ability to flow in turbulent conditions. After reaching a turbulent flow, "polymeric" drag reducing agents become more effective in reducing the frictional energy losses.

The disclosure of Storm is not applicable to the pending claims because the drag reducing agent slurries recited in the pending claims, and thus the components contained in the drag reducing agent slurries in the pending claims, are not used to create a turbulent flow within the pipeline. Instead, the drag reducing agent slurries recited in the pending claims are used to reduce frictional energy losses caused by turbulent flow. Therefore, Storm does not disclose, teach, or suggest the drag reducing agent slurries recited in the pending claims.

Furthermore, in seeking its objective of reducing the viscosity of heavy oil, Storm teaches modifying the viscosity of oil by forming an oil/water/alcohol mixture with water being present in the oil/water/alcohol mixture at a range from 1% by volume to 50% by volume (Col. 3, lines 47-50), and alcohol being present in the oil/water/alcohol at a range from 1% by volume to 10% by volume (Col. 3, lines 53-57). No other materials are added to the oil/water/alcohol, therefore, the heavy oil is present in the oil/water/alcohol at a range from to 40% by volume to 98% by volume. See Col. 3, lines 30-57. Therefore, Storm is directed to the modification of heavy oil viscosity through the use of large volumes of water and alcohol.

The result of mixing the heavy oil with water and alcohol to form the oil/water/alcohol mixtures disclosed, taught, and suggested in Storm is the formation of an emulsified liquid with water as the external phase of these mixtures and small globules of heavy oil as the internal phase of these mixtures with the alcohol acting as an emulsifying or stabilizing agent. The result is a bulk viscosity of the heavy oil/water/alcohol mixtures that is reduced and internal drag due to the physical

viscosity reduction of these flowing mixtures within the pipeline. Only after the viscosity of the heavy oil is sufficiently decreased are "commercial drag reducing agents" useful. See Storm, Col. 2, lines 55-57.

On the other hand, the drag reducing agent slurries recited in the pending claims are capable of reducing drag, and increasing flow, of oil flowing through a pipeline, in turbulent flow that do not require a first modification of the viscosity of the materials flowing through the pipeline.

Additionally, the drag reducing agent slurries recited in the pending claims do not include a suspending material, e.g., an alfol alcohol, at a concentration high enough to provide the heavy oil viscosity reducing function of the oil/water/alcohol mixture disclosed in Storm. In fact, contrary to Storm, the alfol alcohol may be present in the drag reducing agent slurry at a concentration in the range from about 40.0% to about 85.0% based upon the weight of alfol alcohol to drag reducing agent slurry. The drag reducing agent slurries are then injected into a pipeline resulting in less than 500 ppm alfol alcohol based upon weight, and in most cases, between 10 and 50 ppm alfol alcohol based upon weight being combined with the flowing oil. Therefore, when injected, and thus, mixed with oil flowing in the pipeline, substantially less than 1.0% (the minimum amount of alcohol identified in Storm as being effective) of the drag reducing agent slurry present in the pipeline comprises alfol alcohol (1% equates to 10,000 ppm).

Accordingly, Storm only teaches methods of creating an environment within the pipeline, by modifying the viscosity of heavy oil to create a turbulent system, in which drag reducing agents can

optimally function. Storm does not disclose, teach, or suggest any drag reducing agents or processes for forming drag reducing agents and does not teach any of the advantages identified in the present patent application of using alfol alcohols as suspending materials for drag reducing agent slurries. In fact, no characteristics, properties, or components of the commercial drag reducing agents, or any drag reducing agent slurries, or processes for forming drag reducing agent slurries are disclosed, taught, or suggested in Storm.

Therefore, Applicant respectfully submits that Storm is not directed to drag reducing agent slurries or processes for forming drag reducing agent slurries. As such, Applicant respectfully submits that Storm does not render obvious any of the claims pending in this application.

2. There Is No Motivation to Combine Storm with Eaton

As mentioned above, Storm is directed to modification of the viscosity of heavy oil in a pipeline by mixing the heavy oil with water and alcohol at extremely high percentages (1% vol. to 50% vol. of water, 1% vol. to 10% vol. alcohol, remainder of the volume being heavy oil) to form a mixture having a lower viscosity than the heavy oil that was previously flowing through the pipeline. The modification of the viscosity of the oil by forming this mixture creates a more turbulent flow of the oil/water/alcohol mixture through the pipeline. At this point, a polymeric drag reducing agent may be added to the pipeline to further increase flow. However, components of drag reducing agents other than "polymeric" are not disclosed, taught, or suggested.

Eaton '779 and Eaton '570, on the other hand, are both directed to drag reducing agents

themselves. Eaton '779 is directed to drag reducing agents and processes for forming drag reducing agents utilizing certain co-catalysts. Eaton '570 is directed to drag reducing agents and processes for forming drag reducing agents having certain characteristics, e.g., micellular dispersion. Neither of these references disclose, teach, or suggest drag reducing agent slurries having alfol alcohol. Additionally, neither of these references disclose, teach, or suggest modifying the viscosity of the oil flowing in the pipeline to optimize use of drag reducing agents.

As discussed above, Storm does not disclose, teach, or suggest the drag reducing agent slurries recited in the pending claims as performing the function of increasing the viscosity of the heavy crude oil so that the drag reducing agents can be injected into the pipeline. Nor does Storm teach formation of drag reducing agent slurries that are to be combined with the large volumes of water and alcohol that are to be mixed with heavy oil and permitted to flow through a heavy oil pipeline as on continuous emulsified mixture. In fact, to do so would only result in a dilution of the amount of polymer per gallon of suspending material, thereby decreasing the drag reducing agent slurries effectiveness.

Nor does Storm disclose, teach, or suggest forming a polyalphaolefin, mixing the polyalphaolefin with an alfol alcohol to form a drag reducing agent slurry, and then injecting the drag reducing agent slurry into a crude oil pipeline. Instead, Storm teaches mixing all of the heavy oil in a pipeline with water and alcohol to create an oil/water/alcohol mixture that is sufficiently turbulent to permit commercial polymeric drag reducing agents (not drag reducing agent slurries having alfol

alcohols) to reduce drag in a pipeline due to the presence of a "polymer."

Accordingly, Applicant respectfully submits that claims 1-23 are patentable over Storm, either alone or in combination with Eaton '779 or Eaton '570 and respectfully requests that the rejection of claims 1-23 under the provisions of 35 U.S.C. § 103 be withdrawn.

## III. CONCLUSION

In view of the above remarks, Applicant respectfully requests withdrawal of the rejection of claims 1-23 and issuance of a notice allowance with respect to claims 1-23. In order to expedite the examination of this application, Applicant requests the Examiner to contact the undersigned at (713) 220-4168 to discuss any matters that can be resolved by telephone.

Respectfully submitted,

Date: 4/3/2003

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# EXHIBIT A

OIPE JC10 OCT 27 2003 PATENT & TRADEMARK OFFICE

**Attorney Docket No. 86821**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

RECEIVED JAN 27 2004 TC 1700

In re Application of:
Gerald B. Eaton, et al.

Serial No.: 09/877,341

Filed: June 8, 2001

Group Art Unit No.: 1621

Primary Examiner: Unknown

For: DRAG REDUCING AGENT SLURRIES HAVING ALFOL ALCOHOLS AND PROCESSES FOR FORMING DRAG REDUCING AGENT SLURRIES USING ALFOL ALCOHOLS

## FOURTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT UNDER 37 C.F.R. §§ 1.97 AND 1.98

CERTIFICATE OF MAILING
37 C.F.R. § 1.8

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on December 30, 2002.

Signature

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In compliance with the duty of disclosure under 37 C.F.R. § 1.56, it is respectfully requested that this Fourth Supplemental Information Disclosure Statement be entered and the reference listed on attached Form PTO-1449 be considered by the Examiner and made of record. A copy of the reference listed on Form PTO-1449 is enclosed for the convenience of the Examiner.

To Applicant's knowledge, a first Office Action on the merits has not been mailed by the Examiner. Accordingly, this Fourth Supplemental Information Disclosure Statement should be considered in accordance with 37 C.F.R. § 1.97(b)(3).

In accordance with 37 C.F.R. §§ 1.97(g) and (h), this Fourth Supplemental Information Disclosure Statement is not to be construed as a representation that a search has been made or an admission that the information cited herein is material to patentability as defined in 37 C.F.R. § 1.56(a). The submission of the following information should not necessarily be deemed a concession that any particular item constitutes "prior art" to the claimed invention.

Respectfully submitted,

Date: 12/30/03

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FORM 1449A/PTO

**INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

(use as many sheets as necessary)

| Complete if Known | |
|---|---|
| Application Number | 09/877,341 |
| Filing Date | June 8, 2001 |
| First Named Inventor | Gerald B. Eaton |
| Group Art Unit | 1621 |
| Examiner Name | |
| Attorney Docket Number | 86821 |

OIPE JC16 OCT 27 2003 PATENT & TRADEMARK OFFICE

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Sheet 1 of 2

**U.S. PATENT DOCUMENTS**

| Examiner Initials* | Cite No. | U.S. Patent Document | | Name of Patentee | Date of Publication of Cited Document MM-DD-YYYY |
|---|---|---|---|---|---|
| | | Number | Kind Code (if known) | | |
| | IA | 3,645,822 | | Widiger et al. | 02-29-1972 |
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**FOREIGN DOCUMENTS**

| Examiner Initials* | Cite No. | Foreign Patent Document | | | Name of Patentee or Applicant of Cited Document | Date of Publication of Cited Document MM-DD-YYYY | Translation? |
|---|---|---|---|---|---|---|---|
| | | Office | Number | Kind Code (if known) | | | |
| | IK | CAN | 901,727 | | Amann | 05-30-1972 | |
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| Examiner Signature | | Date Considered | |
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

| FORM 1449A/PTO | Complete if Known | |
|---|---|---|
| **INFORMATION DISCLOSURE STATEMENT BY APPLICANT** | Application Number | 09/877,341 |
| | Filing Date | June 8, 2001 |
| | First Named Inventor | Gerald B. Eaton |
| (use as many sheets as necessary) | Group Art Unit | 1621 |
| | Examiner Name | |
| | Attorney Docket Number | 86821 |

OIPE JC10 OCT 27 2003 PATENT & TRADEMARK OFFICE

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Sheet 2 of 2

| OTHER DOCUMENTS | | | |
|---|---|---|---|
| Examiner Initials* | Cite No. | Include name of author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.) date, page(s), volume-issue number(s), publisher, city and/or country where published. | Translation? |
| | IL | JOHN BOOR, JR., Ziegler-Natta Catalysts and Polymerizations, 1979, Chapter 18: Kinetics, pages 464-511, Academic Press, New York, USA | |
| | IM | TAD W. TAYLOR, et al., Physiochemical Kinetics of Liquid Phase Propylene Polymerization, pages 191- 223, Eleventh Midland Macromolecular Meeting, August 17-21, 1981, MMI Press, Midland, Michigan, USA | |
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| Examiner Signature | | Date Considered | |
|---|---|---|---|

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.